Tech Tip

LUBE SERVICE 149

NORMAL OR SEVERE SERVICE

Selecting the Proper Lube Service Interval

Are you recommending the proper lubrication service interval to your customers? Be aware that there is more to making the service recommendation than monitoring the miles driven between lube services. Technological advancements in engine design, its support systems, in addition to improvements in the quality of the lubricants have resulted in an increase in the service intervals. While service intervals have been extended, there may exist a false sense of security, as some vehicle owners may unknowingly select service intervals beyond what is healthy for the engine or recommended by the vehicle manufacturer. If you ask an engine re-builder or a technician who performs major engine repairs about service intervals, the conversation will quickly move toward more frequent oil and filter changes. These techs have seen it all. Engines that should have given 200K miles (plus) of service may have met an early demise or experienced major damage or component failure due to poor lubrication, often due to heavy deposit formations resulting from improper service intervals.

There has been much controversy over when the oil and filter should be changed. One thing all vehicle manufacturers agree on is that two service intervals are necessary, based on the operating characteristics of the vehicle. Those intervals are referred to as Severe Service and Normal Service. Selecting the best service interval can be confusing to the vehicle owner, as many are surprised to learn that their vehicle qualifies for the Severe Service category. A discussion with the vehicle owner concerning their driving habits and conditions should be the first step in determining the proper service interval for their vehicle. Read on to determine if your customer's vehicle qualifies as a Severe or Normal Service driven vehicle.

SOME FACTS ABOUT CRANKCASE LUBRICANTS

a) The engine oil serves as a lubricant to prevent the moving parts from making metal-to-metal contact by providing a protective film.

b) The oil serves as a coolant to remove the engine heat, preventing damage to the internal engine components.

c) The oil contains inhibitors to prevent corrosion and detergents to help keep the engine clean, minimizing the accumulation of deposits. When these protective chemicals become diluted, serious engine damage can be incurred.

d) The engine oil is exposed to high temperatures, which can affect the life of the additives, the purpose of which is to control the viscosity of the oil and prevent corrosion and deposit formations. Increased oil temperature speeds up the oxidation rate of the oil, which promotes a thickening of the oil, thus restricting the oil flow.

e) Crankcase condensation can promote the formation of acids in the lubricant.

f) The engine oil becomes diluted due to the fuel and moisture collecting in the crankcase. This is prompted by cold starts and short trip driving, which prevents the engine from reaching its normal operating temperature, whereby evaporation will rid the crankcase of the mentioned elements. This is especially a problem in low ambient temperatures.

g) Sump capacities have been reduced, which puts further stress on the lubricant.

h) Smaller displacement engines work harder, putting more stress on the lubricant.

i) During the combustion event, gases containing fuel, water and acids get past the piston rings, contaminating the crankcase oil, causing a degrading effect.

Most of the motoring public assumes that their vehicle qualifies in a Normal Service category, when the opposite is often the case. Let's consider some examples of operating conditions that determine in which service category the vehicle should be placed.

SEVERE SERVICE

Your vehicle should be serviced under the Severe Service maintenance schedule if it is driven under one or more of the following conditions:

a) Vehicles that are repeatedly short trip driven for distances of 5 miles or less. This pattern results in an accumulation of sludge, varnish and other deposits, due to the oil not reaching its normal operating temperature, which can burn off the condensation and other contaminants.

b) Vehicles driven 10 miles or less in ambient temperatures below freezing.

c) Periods of extended idling, as with police cars, delivery vehicles, and taxis, or slow speed driving for long distances, as in heavy traffic.

d) In extreme hot weather (above 90 degrees F) in heavy traffic.

e) Off-road or in dusty conditions.

f) Rough, muddy, sandy, or salt spread roads.

g) Pulling a camper, top carrier or a trailer.

h) Driving continuously while exceeding normal highway speeds.

i) Frequent starting and stopping.

NORMAL SERVICE

Long highway miles are easy on the engine lubricant. If none of the aforementioned conditions apply to the operating characteristics of the vehicle, then the maintenance should be performed in accordance with the vehicle manufacturer's Normal Service schedule.

MILEAGE SERVICE INTERVALS

The majority of the vehicle manufacturers agree on a Normal Service interval of 7,500 miles and a Severe Service interval of 3,000-3,750 miles. Time limits may vary from 3-6 months. Vehicles that require the use of synthetic blend lubricants may have longer service intervals, such as some of the European built vehicles.

Some GM applications reference the service intervals based on an Oil Life Monitoring System instead of an established mileage interval. This system determines the proper service interval based on a computer based software algorithm that determines the proper service interval by monitoring certain engine operating conditions. These include ambient temperature, engine revolutions, mileage, engine operating temperatures and conditions, load, throttle position and engine vacuum. The system does not actually sense the condition of the oil. GM states that the system may extend the service interval to 12,000 miles on a vehicle that is continually highway driven in a warm climate, or to 3,000 miles or less on a short trip driven vehicle in a cold climate.

VARIABLE VALVE TIMING

Many of the newer engines, both foreign and domestic, are fitted with a variable valve timing system that allows a continuous adjustment to the camshaft, referred to as cam phasing. This system allows valve overlap during all driving conditions to achieve optimum performance, fuel economy and lower emission output.

The variable valve timing system will pose many challenges for technicians, as the viscosity of the engine lubricant can have a detrimental effect upon the operation of the system. Often customers request a specific brand and viscosity oil based on a good past experience or recommendation from a friend or technician. Make certain that you install the vehicle manufacturer's recommended viscosity lubricant. ***Explain to the customer the importance of a scheduled maintenance service on vehicles equipped with this camshaft design.*** The oil level should be frequently checked and not allowed to become old and contaminated. Additives that increase the oil viscosity should not be used in this engine design. Keeping the engine clean internally is imperative in maintaining good engine performance. Contaminated oil or the improper viscosity will result in an illuminated Check Engine Light, multiple codes stored in memory and poor engine performance. For more information concerning the Variable Valve Timing System, refer to Tech Tip #144 Smart Engine Systems.

A large percentage of vehicles are driven in a Severe Service category and are serviced in accordance with Normal Service conditions. This is not good for the life of the engine. Oil is cheap insurance against costly engine damage.

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